OPEN ACCESS

ORIGINAL ARTICLE

Treatment Cost of Road Traffic Accidents (RTAs) at a teaching hospital in Pakistan: A step-down costing study

Aamir Afzal[2], Hajr e Aswad[2], Mariyam Sarfraz[3]

[1,2]*MS-Health Management & Economics (HME), Health Services Academy*
[3]*Assistant Professor, Health Services Academy*

Correspondence: *Aamir Afzal*
aamirafzal222@gmail.com

Abstract

Objective: To determine the health provider cost of treatment for road traffic accidents in public sector, tertiary level hospital: Islamabad Region-Pakistan.

Materials & Methods: A step down cost accounting approach was used to estimate the costs. Costs included personnel, equipment, direct and indirect costs. Data about the number of injuries resulting from RTAs between January to December, 2015 was obtained from HMIS Database of PIMS hospital, Islamabad. Treatment costs of injuries were identified by reviewing all 2400 medical records in a year that were selected universally who were admitted in department of accident & emergency, PIMS hospital.

Results: Total budget of PIMS hospital for the year 2015 was PKR. 2,385 million ($ 22,362,869) in which 7% (PKR. 166,950,000; $1,565,401) were allocated for Department of Accident & Emergency. Out of this budget, 80% (Rs. 133,560,000; $1,252,321) were allocated for patients admitted in the hospital in emergency. In total 2,400 admitted patients of road traffic accidents (RTAs) were included in the study period. The total annual burden of cost on the treatment of admitted patients of RTA was about PKR. 96,808,130 ($907,718) which was 57.98% of the total budget allocated for Department of Accident & Emergency. Direct costs were RKR. 21,816,621 (22.54 %; $204,563). The total indirect cost were PKR. 7,474,782 (7.72 %;$70,087) whereas personnel cost were PKR. 56,844,000 (58.72%; $532,996) while equipment cost absorbed PKR. 10,672,727 (11.02 % of the total costs on RTA, $100,072).

Conclusion: This study indicated that the burden of injuries and cost of treatment incurred as a result of road traffic accidents in Islamabad is substantial which can now safely be a reason at this time to open eyes for the government and stakeholders to foresee the rest of the other urban areas of the country.

Keywords: Cost, Road Traffic Accidents, Total Cost, Injuries

Cite as: Afzal A, Aswad S, Sarfraz M. Treatment Cost of Road Traffic Accidents (RTAs) at a teaching hospital in Pakistan: A step-down costing study. BMC J Med Sci 2020. 1(2): 25-31.

Introduction

Injures due Road Traffic Accidents (RTAs) is one of the root cause of death among adolescent and adult age group with an estimated that 3,500 lives lost every day due to the injuries caused by road traffic accidents globally.[1] Around 90% of RTIs related deaths occur in low and middle income countries (LMICs)[2]. Mortality from road traffic accidents is predicted to decline by 30% in high-income countries (HICs).[1] However, a substantial increase is expected in LMICs. A total of 1 - 3% of gross national product (GNP) is lost globally due the lack of work on the prevention of road traffic injuries, particularly from LMICs, approximating to $ 500 billion in total.[4] Road traffic injuries is one of the devastating issue that lead families under huge economic burden associated with cost of medical care, rehabilitation and loss of productive life of usually young occupants.[5]

The burden of road traffic accidents are a significant, cause of any disability, death and economic loss in developing countries like Pakistan. Majority of the emergency visits in public hospitals are injury related; with road traffic injures contributing a significant proportion. [6] The first national injury survey of Pakistan (NISP, 1997) showed the yearly incidence of 15 RTIs for every 1000 person. The relative risk for RTIs was higher in males (labors and street vendors), aged 16 - 45 years.[7] In Pakistan at tertiary care facilities, 25% of the emergency room visits are related to injuries, whereas one-third of the surgical beds and almost 50% of the neurosurgical beds are occupied by patients who have sustained injuries[8].The Road Traffic Injury Study of Pakistan compared various sources of available data including police

Authorship Contribution: [1]Data Collection, Data Analysis & Manuscript writing, [2]Literature research & referencing, [3]Topic selection & Supervision

Funding Source: none
Conflict of Interest: none

Received: September 4, 2020
Accepted: January 11, 2021

records and government agencies over the last 42 years (1956 - 1997).[9]

The injuries include majority occupants of motor vehicles; however, commonly pedestrians too were victimized. One of the initial study conducted in Pakistan's on road traffic injury surveillance project held in Karachi city showed the annual incidence of occupants in road traffic accidents to be 184.3 per 100,000 population whereas mortality to be 5.7 per 100,000 population. When compared to the National Injury Survey of Pakistan (NISP), gross differences were observed in the underestimation of incidence and mortality rates for all ages in the surveillance study.[10]

In an under developing country like Pakistan, road traffic accidents (RTAs) are associated with significant health expenditures in the public sector but measuring costs incurred on RTAs in Pakistan is still lacking due to the scarce resources and health inequities. The objective of the study was to determine the health provider cost of treatment for road traffic accidents in public sector, tertiary level hospital. This study therefore seeks to determined the current health service provider's cost of managing road traffic accidents in Pakistan Institute of Medical Science (PIMS), which was also be a reflection of similar cost in other hospitals of Islamabad region.

Materials and Methods

This was a cross sectional, retrospective study, conducted in Pakistan Institute of Medical Sciences (PIMS). Data of all patients admitted to Accidents & Emergency department as a result of road traffic accidents were included in the study which includes treatment costs from provider (human capital cost approach) perspective was evaluated in Pakistan Institute of Medical Sciences (PIMS) in Islamabad region. The retrospective data of 01 year i.e January 01, 2015 to December 31, 2015 was retrieved from Hospital Management Information System (HMIS) database of PIMS hospital which was used for all admitted patients presenting with road traffic accidents for analyzing health care treatment costs born by the hospital on the treatment of RTA. The patients presenting with road traffic accidents (RTA) admitted in the hospital (PIMS Hospital) was the study population. These were identified from the Accidents and Emergency department of the respective hospital. Admitted patients (entitled and non-entitled, public and private) with in the specified time (duration of hospitalization from admission to discharge of patient in the ward) with all ages of both gender were included in the study. Admitted patients of RTA referred from OPD of the hospital and admitted patients of RTA referred from other hospitals whereas half or partially filled or missing information of admitted patients of RTA in the retrospective data 01 year was excluded

Data Collection and Analysis: Data was collected to analyze the treatment of cost of RTA admitted patients from the perspective of hospital by using step down costing accounting (SDCA) which included the cost bear by the hospital for providing different product and services for the medical care or treatment on RTA from its own sources. The method allows hospital support departments to allocate costs to each other and ultimately to the hospital operating departments. The support departments are ranked. The ranking is based on the percentage of costs that a support department incurs to support other support departments. The support department with the highest percentage is allocated first. All of its costs are allocated out whether to an operating department or to another support department. After that, the support department with the second-highest percentage is allocated. Step by step, the costs for each support department will be fully allocated. In the end, the calculation will be nil because all costs will be allocated.[23] A semi-structured Performa was used to collect and analyze treatment cost from provider's perspective which have four cost categories direct cost, indirect, personnel and equipment cost.

Results

A total of 1,477,753 patients presented in Pakistan Institute of Medical Science (PIMS) hospital with road traffic accident injuries during January to December 2015. Of these, 1,045,981 (70%) patients presented in the OPD whereas 61,483 patients were admitted in hospital. There were 431,772 (29.2%) emergencies presented in PIMS hospital among which 34,103 (7.8%) cases were of road traffic accidents (RTAs); of these 2,400 (7.0%) patients of road traffic accidents were admitted in hospital.

Demographic characteristics of admitted patients of road traffic accidents are given in Table I below. Out of 2400 admitted patients, 1512 (63%) patients were between ages of 21 – 40 years whereas 528 (22%) patients were aged less than 20 years. There were 1723 (71.8%) male and 677 (28.2%) female patients admitted in accidents & emergency ward whereas 888 (37%) RTA patents have rural residence and 1512 (63%) patients belongs to urban residence.

Types of injuries incurred by admitted patients, length of hospital stay and accident causing vehicle are given in Table II. Out of 2400 admitted RTA patients, 1272 (53%) are those patients who have hospital stay of less than 01 week. In the study, most common site of injury of road traffic accidents was thigh / pelvis 780 (32.5%) and knee & foot 675 (28.1%)

respectively. There are 898 (37.4%) admitted patients of road traffic accidents who are using motor cycle / bicycle as the most common cause of injury whereas 526 (21.9%) admitted patients of road traffic accident are caused by using or in contact with car.

Table I: Demographic Characteristic of RTA admitted patient

		N (%)
Age (years)	less than 20 years	528 (22)
	21 - 40 years	1512 (63)
	above 40 years	360 (15)
Gender	Male	1723 (71.8)
	Female	677 (28.2)
Residence	Rural	888 (37)
	Urban	1512 (63)
Total 2400 admitted patients of RTA		

Table II: Baseline Characteristic of RTA admitted patients

Length of Hospital Stay	**N (%)**
Less than 01 week	1272 (53)
02 – 03 weeks	648 (27)
01 month	456 (19)
Above 01 month	24 (01)
Site of Injuries	**N (%)**
Thigh / Pelvis	780 (32.5)
Knee & Foot	675 (28.1)
Skull	321 (13.4)
Arm	176 (7.3)
Forearm	158 (6.6)
Chest	107 (4.5)
Shoulder	83 (3.5)
Spine	74 (3.1)
Abdomen	26 (1.1)
Causes of injury	**N (%)**
Motor cycle	898 (37.4)
Car	526 (21.9)
Bus	317 (13.2)
Truck	235 (9.8)
Pick up	146 (6.1)
Others causes	278 (11.6)
Total 2400 admitted patients of RTA	

Table III shows the costs incurred by the hospital in treating admitted patients of road traffic accidents in Emergency Department of PIMS Hospital. The total annual cost includes all the expenses born by the hospital for the treatment of admitted patients of road traffic accidents. The total annual cost for the calendar year 2015 with 2400 admitted RTA patients in emergency department was Rs. 96,808,130. Average cost per patient is Rs. 61,313 by hospital on the treatment of admitted patients of road traffic accidents. In the study, the personnel cost was calculated to be Rs. 56,844,000 (58.72 % of the total cost) while equipment cost absorbed Rs. 10,672,727 (11.02% of the total cost). Similarly total annual indirect cost includes administration cost, utilities cost, repair & maintenance cost and general cost. The total indirect cost of treatment for admitted patients of road traffic accidents for the year 2015 was Rs. 7,474,782 which shared 7.72% of the total cost following by direct cost Rs. 21,816,621 which was the second major portion i.e 22.54% of the total hospital cost born by the hospital on the treatment of admitted patients of road traffic accidents. The total direct cost includes cost of medicines, cost of labotoary & diagnostics and consumables cost.

Table III: Hospital Cost on Road Traffic Accidents (RTA) admitted patients

Cost Components	**Total Annual Cost** (Rs)	**% of Total Annual Cost**	**Cost / patient**
Personnel Cost [1]	56,844,000	58.72	23,685.0
Equipment Cost [2]	10,672,727	11.02	4,447.0
Indirect Cost [3]	7,474,782	7.72	3,114.5
Direct Cost [4]	21,816,621	22.54	30,066.5
Total	96,808,130	100	61,313.0

[1]Personal cost includes data of gross salaries of medical and supporting staff of emergency department.

[2]Equipment Cost depreciation has been determined by 10% by straight line method from finance department of the hospital for the calendar year 2015

[3] Indirect cost includes cost of administration, cost of utilities, repair & maintenance and general cost

[4] Direct cost includes the collection of data on services delivered directly from each of 2,400 admitted RTA patients in emergency department from either file record, hospital HMIS and finance department till discharge from the ward.

Personnel cost have the major share of total annual cost for admitted patients of road traffic accidents which was Rs. 5,6844,000. Personnel cost includes gross salaries, daily time spent, no. of staff of personnel and average salary per day in ward. There were 27 post graduate trainees working in the ward and their gross salaries have been added and then multiplied by the number of staff personnel and time spent (hours) and then divided by total admitted patients of road traffic accidents for the year 2015. The post graduate trainees shared Rs. 6,750 cost per patient admitted of road traffic accidents. Similarly, there were 12 registrars who shared Rs. 6,600 cost per admitted patient of road traffic accidents. The share of supporting staff is Rs.5,775 cost per patient admitted in ward as shown in Table IV

Table V shows the distribution of total indirect cost born by the hospital on admitted patients of road traffic accidents. Total indirect cost born by the hospital on treatment of 2400 admitted patients of road traffic accidents for the calendar year 2015 was Rs. 7,474,782, this includes administrative cost, utility cost, repair & maintenance cost and general cost. Administrative cost incurred by the hospital on the treatment

Table IV: Illustrated Hospital Personnel Cost (Rs) **on RTA admitted patients**

Personal	No.	Monthly salary for each staff	Monthly salary for all staff	Total Annual Salary	Salary / day	Cost / patient
Consultant	2	180,000	360,000	4,320,000	13,627.8	1,800.0
Registrar	12	110,000	1,320,000	15,840,000	49,968.5	6,600.0
PG Trainee	27	50,000	1,350,000	16,200,000	51,104.1	6,750.0
House Officer	23	24,000	552,000	6,624,000	20,895.9	2,760.0
Supporting Staff*	21	266,000	1,155,000	13,860,000	43,722.4	5,775.0
Total	85	630,000	4,737,000	56,844,000	179,318.6	23685.0

*Supporting staff =head nurse (2), staff nurse (8), ward boy (4), aya (1), sanitary worker (4) & dresser (2)

of admitted patients of road traffic accidents is Rs. 4,705,600 (63.0% of the total indirect cost) which is the major portion of gross salaries of administrative staff that includes Rs.4,560,000 (96.9% of total administrative cost). The average cost per patient with regard to administrative cost is Rs. 1,960.7. Cost of Utilities take 27.5% portion of indirect cost which is the second major portion of the indirect cost and cost per patient of utilities expense incurred by the hospital on admitted patients of road traffic accidents was Rs. 857.7. The cost of utilities includes sui gas cost Rs. 1,650,454, electricity cost Rs. 187,681, different gases cost Rs. 95,100 and telephone cost Rs. 125,300 which were incurred on the treatment of admitted patients of road traffic accidents. Similarly, repair & maintenance cost take Rs. 673,200 (9.0% portion of the total indirect cost) incurred on admitted patients of road traffic accidents with average cost per patient was Rs. 280.5 following by general expense Rs. 37,447 (0.5% segment of the total indirect cost) with average cost per patients was Rs. 15.6.

The total direct cost absorbed by the hospital on the treatment of admitted patients presented with road traffic accidents for the calendar year 2015 was Rs. 21,816,621. Direct cost includes sub cost factors of direct cost components which comprises services delivered directly to admitted patients of road traffic accidents by the hospital. The highest portion in direct cost is the cost of medicines, Rs. 16,009,091 which is the 73.4% of the total direct cost. The second highest portion in the direct cost is the cost of consumables, Rs. 4,079,530 which is the 18.7% of the total direct cost. Cost of laboratory & diagnostic is the third highest portion of the direct cost, Rs. 1,728,000 which is 7.9% of the total direct cost. The average cost per patient incurred by the hospital on the treatment of admitted patients of road traffic accidents with regard to cost of medicine, laboratory & diagnostic cost and consumables cost is Rs. 6,670.5, Rs. 720.0 and Rs. 22,676.0 respectively, as shown in Table VI.

Table VII shows the summary of informations and various costs calculated from the data of 2,400 admitted patients of road traffic accidents for the calendar year 2015. Total duration of length of hospital stay was 30,263 days, among them minimum and maximum length of hospital stay of admitted patients of road traffic accidents was from a single day upto 88 days. Average length of hospital stay was 12.6

Table V: Distribution of Total Indirect Cost across different Cost Categories & Average Cost per patient for the calendar year 2015

COST COMPONENTS OF INDIRECT COST	Total Annual Cost of Indirect Cost Components	% of Total Indirect Cost Components	Breakup of Indirect Cost Components	% of sub categories of Indirect Cost Components	Cost / Patient
Administrative Cost	4,705,600	63.0			1,960.7
Administration staff salaries & Allowances			4,560,000	96.9	1900.0
Stationary			40,600	0.9	16.9
Printing & Publishing			32,200	0.7	13.4
Books & Periodicals			16,800	0.4	7.0
Diet Charts			56,000	1.2	23.3
Utilities	2,058,535	27.5			857.7
Sui gas			1,650,454	80.2	687.7
Electricity			187,681	9.1	78.2
Gases			95,100	4.6	39.6
Telephone			125,300	6.1	52.2
Repair & Maintenance	673,200	9.0			280.5
Equipment			329,868	49	137.4
Building			323,136	48	134.6
Furniture			20,196	3	8.4
General (linen, uniform & laundry)	37,447	0.5	37,447		15.6
TOTAL INDIRECT COST (Rs)	**7,474,782**	**100.0**	**7,474,782**		**3,114.5**

days whereas average cost per patient per day born by the hospital on the treatment of admitted patient of road traffic accidents was Rs. 3,198.89. Similarly, average cost of patient during admission as a case of road traffic accident was Rs. 40,338.00 whereas total average cost incurred by the hospital on treatment of admitted patients of road traffic accidents was Rs. 44,784.46.

Table. VI: Distribution of Total Direct Cost across different Cost Categories and Cost per patient for the calendar year 2015

COST COMPONENTS OF DIRECT COST	Total Annual Cost of Direct Cost Components	% of Total Direct Cost Components	Cost / Patient
Medicine	16,009,091	73.4	6,670.5
Laboratory & Diagnostic	1,728,000	7.9	720.0
Consumables Cost	4,079,530	18.7	22,676.0
TOTAL DIRECT COST (PKR)	**21,816,621**	**100.0**	**30,066.5**

Table VII: Summary of Cost for RTA admitted patients for the year 2015

MISCELLANEOUS INFORMATIONS & SUMMARY OF COST (RS)	
Total Duration of length of Hospital Stay	30,263 days
Minimum Length of Hospital Stay	01 day
Maximum Length of Hospital Stay	88 days
Average Length of Hospital Stay [1]	12.6 days
Average Cost Per Patient Per Day [2]	Rs 3,198.89
Average Cost of Patient During Admission [3]	Rs 40,338.00
Total Average Cost of RTA patients [4]	Rs 44,784.46

[1] Mean length of hospital stay (days) of 2,400 admitted patients of RTA for the year 2015.

[2] Total hospital cost (Rs.96,808,130) incurred on treatment of 2400 RTA admitted patients divided by the number of RTA admitted patient days (30,263 days).

[3] Cost per patient per day multiplying with mean duration of hospital stay.

[4]Cost per patient per day multiplying with 14 considering there are 14 patients daily.

Discussion

There are a number of methods to transfer overhead costs from one department from another. One of these is the Step-Down Method. Being able to properly allocate costs from one department to another is a major task of accounting. Unlike some other methods, the step-down method allows you to transfer costs from one service department to another. The biggest advantage of the step-down method is that it makes it clear that some departments, which otherwise might not be seen as doing so, make significant contributions to the business. Also, this method makes sure that different departments are charged for using the services of other departments, and it more closely reflects the real nature of the company.[4]

A study conducted in 2011 showed that approximately 19% (56) of the road crash victims have severe injury. Majority of the road crash victims were male (73%), and approximately half had less than primary level education. The mean age was 32.4 years (range 3-75 years), with 75% (225) aged 20-49 years and 12% aged ≥50 years[11]. The total annual burden of cost on the treatment of admitted patients of RTA was about PKR. 96,808,130 ($907,718) which was 57.98% of the total budget allocated for Department of Accident & Emergency. Study findings showed that the total cost incurred by the hospital on the treatment of road traffic accidents was PKR 96.80 million (907,642 USD) in one year, 22.54% of which were absorbed by direct costs (medical costs and cost of laboratory & diagnostics), 7.72% were related to indirect cost which includes administration cost, utilities and repair & maintenance cost whereas 11.02% and 58.72% related to equipment cost and personnel cost respectively. We calculated hospital cost incurred by the hospital on the treatment of admitted patient of road traffic accidents in Pakistan for the first time. According to a report by the World Health Organization, the annual cost of road traffic accidents in LMICs is between 1 and 2 % of GDP[12]. The cost of road traffic accidents in Egypt in 2008 was around 10 billion Egyptian Pounds, and about 1% of their GDP. Moreover, the cost of road traffic accidents in Vietnam was around 0.45% of their GDP in 2004.[13] World Health Organization (WHO) assess the economic burden of traffic injuries for the Eastern Mediterranean Region, which includes the UAE, whereas traffic accidents put an economic burden in Abu Dubai estimated at 2.3 to 2.9 percent of the country's GDP. In the UAE, the total cost for 2009 was Dh21.4 billion. Cost of road traffic injuries about Dh7.6 million and severe crashes with disabilities cost a total of Dh8.5m. In Abu Dhabi, car accident deaths fell from 376 in 2010 to 334 last year - a drop of 11.1 per cent. In the UAE, deaths fell from 826 in 2010 to 720 last year, a drop of 12.8 percent.[11]

The study showed that total personnel cost of treating admitted patients of road traffic accidents would be GBP 367,389 (276,232 USD) a years. Personnel cost of treating admitted patient of road traffic accidents to be GBP 20.60 (15.5 USD) if they were seen by a consultant, GBP 44.95 (33.80 USD) if seen by a senior house officer, and GBP 26.71 (20.08 USD) if seen by a registrar. The greatest difference in the costs was between consultant and senior house officers. The study also indicates that treatment of admitted patients of road traffic accidents in emergency department by consultant reduced hospital costs, it is so because of the consultant's clinical expertise and vast experience of patient's management which makes

consultant's to be an important factor in decreasing the health care provider cost.[14]

Similarly, a study conducted on admitted patients of road traffic accidents in National Institute of Traumatology & Orthopedic Rehabilitation (NITOR), Dhaka; which is a government run facility showed that indirect cost involved was much more than direct cost. Total indirect cost incurred was > 10,000 in 45.5% patients while it was Taka < 2,000 in 1.8% patients with average cost being Taka 8,440. There was 1.8% food cost (Taka) and miscellaneous expense was 9.1% of the total indirect cost (Taka) incurred by the hospital on admitted of patients of road traffic accidents.[15] Total hospital expenses are highly administrative cost driven. Across the entire department, administrative expenses (staff salaries & allowances) account for approximate 55% of the total hospital cost.[16] Our study finding showed that administrative cost incurred by the hospital on the treatment of admitted patients of road traffic accidents is PKR. 4,705,600 (44,122 USD) (63.0% of the total indirect cost) which is the major portion of gross salaries of administrative staff that includes PKR. 4,560,000 (42,757 USD) (96.9% of total administrative cost). The average cost per patient with regard to administrative cost is PKR. 1,960.7 (18.4 USD); following by general expense PKR. 37,447 (351.1 USD) (0.5% segment of the total indirect cost) with average cost per patients was PKR. 15.6 (0.1 USD). Similarly, the cost of diet account PKR. 56,000 (525 USD) (1.2% of the total administrative cost) incurred by the hospital on the admitted patients of road traffic accidents.

Mean length of hospital stay in our study for admitted inpatients of road traffic accidents was 12.6 days and whereas figures reported by a study from Bangladesh was 5.7 days. However, it is significantly higher than the length of hospital stay 21.5 days reported by a study conducted in Bangkok.[17] This might be because we did not follow up those patients that were referred to tertiary care for further treatment. In addition, the latter study included hospitalization days of rehabilitation and recovery days. The other reasons for the difference in length of hospital stay in this study compared with other countries might be due to difference in the health system of delivering facilities and differences in the study designs. However, the differences in the treatment cost of road traffic accidents among the countries might be partly because of variations in their health care systems, service costs, and pattern of injuries, the safety of vehicles and roads, the driving culture and a variety of other factors. It is therefore, important to identify the main factors contributing to the road traffic accidents, to develop and implement strategies to reduce their occurrence and to mitigate their consequences. Although this study provides a valuable insight about the cost of treatment on admitted patients of road traffic accident but there are several limitations that should be considered in any future study. In our study, healthcare provider cost incurred on the treatment of RTA admitted patients is not the true reflection cost because it does not included the out of pocket expenditure (OOP) on health care as NHA and other studies form Pakistan show a high OOP of treatment of accidents victims. Outpatient Department (OPD) patients of road traffic accidents referred by the PIMS hospital, was not included which is the limitation of the study. Similarly, patients of RTA referred from other hospitals to PIMS hospital, was also not included in the treatment cost which cannot be the true reflection of cost incurred by the hospital on the treatment of road traffic accidents. The study was only done in orthopedics ward (surgical ward – II, PIMS hospital) which was also working as a department of accidents & emergency and a major department to received admission of patients of road traffic accident, so the patients admitted / refer in other departments like neurology department, cardiology department, surgical ICU may underestimate our results.

Conclusion

This study concludes that the treatment cost incurred by the hospital on the treatment of patients of road traffic accidents is greater and the economic burden of road traffic accidents in Pakistan at a tertiary level is substantial. The analysis of hospital cost in accident & emergency ward with regard to the admitted patients of road traffic accidents at PIMS hospital (tertiary level), provides food for thought to understand the structure of cost in order to identify the usually unrecorded costs and to get more clear picture on the cost absorbed by the hospital. This concludes that prevention of road traffic accidents should be considered as a top priority for the policy makers and efforts should be made to identify and prioritize improvement strategies both at public and private level in Pakistan.

References

1. Peden MM, Scurfield R, Sleet D, Mohan D, Hyder AA, Jarawan E, et al.World report on road traffic injury prevention. Geneva: WHO; 2004.
2. World Health Organization, violence and injury prevention and disability (VIP). Road traffic injuries. 10 facts on global road safety. Geneva: WHO; 2011.
3. Murray CJL, Lopez AD. The global burden of disease and injury series. A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Geneva: WHO; 1996. Volume I.
4. Newton K. 2017. Step-Down Method of Cost Allocation. [online] www.study.com. Available at: http://study.com/academy/lesson/step-down-method-of-cost-allocation.html [Accessed 17 Aug. 2017]

5. World Health Organization, Violence and injury prevention and disability (VIP). Global status report on road safety time for action. Geneva: WHO; 2009.
6. BA Muhammad, KA Muhammad, IM Tayyeb, Ali M. Road Traffic Injuries in Pakistan: Challenges in estimation through routine hospital data. J Ayub Med Coll. 2008; 20 (3): 108-11.
7. Ghaffar A, Hyder AA, Masud TI. The burden of road traffic injuries in developing countries: the 1st National Injury Survey of Pakistan. Public Health2004; 118:211-7.
8. Nasser MR, Awais SM, Akhtar NM. Epidemiology of trauma. Pak J Surg. 1994;10:847.
9. Ghaffar A, Rajput AM, Masud TM, Naru IA, Amjad Ch.M. Road traffic injuries in Pakistan - trends, causes, and policy implications. Islamabad, Pakistan. National Injury Research Centre, Health Services Academy. Islamabad: Ministry of Health, Government of Pakistan; 2001.
10. Shamim S, Razzak JA, Jooma R, Khan U. Initial results of Pakistan's first road traffic injury surveillance project. Int J Injury Control Safety Promot 2010; 18:213-7.
11. Zacharias, A. 2017. Traffic Accidents. [online] https://www.thenational.ae. Available at:https://www.thenational.ae/uae/traffic-accidents-cost-nearly-3-of-gdp-1.408912 [Accessed 11 Apr. 2012]
12. Peden M, Scurfield R, Sleet D, Mohan D, Hyder AA, Jarawan E, et al. World report on road traffic injury prevention. Geneva: World Health Organization, 2004.
13. Thuy T, Xuan N , Tu T. The cost of road traffic accidents in Vietnam. Proceedings of the Eastern Asia Society for Transportation Studies. 2005;5:1923-33
14. Dale J, Lang H, Roberts AJ, Green J, Glucksman E. Cost effectiveness of treating primary care patients in accident and emergency : a comparison between general practitioners, senior house officers and registrars. BMJ. 1996; 312: 1340-4
15. Karim M, Khan AW, Farah S. Economic Impact of Road Traffic Accident on Patients Attending at National Institute of Traumatology & Orthopedic Rehabilitation (NITOR), Dhaka. Ibrahim Card Med J. 2011: 1 (2) ; 46-9
16. Bamezai A, Melnick G, Nawathe A. The Cost of an Emergency Department Visit and Its Relationship to Emergency Department Volume. Ann Emerg Med. 2005: 45 (5); 484-90 doi:10.1016/j.annemergmed.2004.08.029
17. Riewpaiboon A, Piyauthakit P, Chaikledkaew U. Economic burden of road traffic injuries: a micro-costing approach. Southeast Asian J Trop Med Public Health. 2008 Nov; 39 (6):1139-49